REMARKS/ARGUMENTS

Claims 1-22 are pending in this application. Claims 1-6 and 17 have been allowed. The Examiner is thanked for the allowance of these claims. Claims 7-10, 12 and 18-22 stand rejected. Claim 9 has been rejected under 35 U.S.C.§112 as indefinite. The Examiner objects to claims 11 and 13-16, but indicates that these claims would be allowable if rewritten in independent form.

First addressing the rejection of claim 9 under 35 U.S.C.§112, Applicants initially submit that the terms "cut-in and cut-out points" are clearly defined in the specification. See for example page 24, line 24 through page 25, line 15 of the present application. Cut-in and cut-out points define the points where the cat ear circuit operates and are shown, for example, in Fig. 28 by the "cat ear" or tail portions with respect to the AC line waveform.

However, in order to expedite prosecution, Applicants have amended claim 9 to recite that the cat ear circuit draws current from the AC line when the rectified voltage is below a fixed value. Thus, with reference to Fig. 28, when the rectified voltage from the rectifying circuit is below a fixed value, corresponding to the cat ear regions in the AC waveform shown in Fig. 28, the cat ear circuit draws current from the AC line. This is discussed beginning at page 24, line 27 of the present application. This language is essentially equivalent to the original language in as much as the cut-in and cut-out points were defined to be those times when the AC line voltage is below a predetermined voltage.

In order to provide antecedent basis for the amendment of claim 9, claim 7 has also been amended to refer to a rectified voltage provided from the rectifying circuit.

Turning now to the Examiner's rejection based on the prior art, before discussing the Examiner's rejections of claims 7, 8, and 18-22 under 35 U.S.C. 102(b) as being anticipated by Shackle et al., Applicants note that element 60 of Shackle et. al., while labeled in Fig. 6, is not referenced in the specification. However, one skilled in the art will recognize that the circuit of Fig. 6 is a boost converter. At c. 8, ll. 61-65, Shackle et al. note that Fig. 6 illustrates a converter for supplying the inverter 54 of Fig. 2. Fig. 2 shows the inverter 54 is supplied by an unregulated boost circuit 52 (see c. 5, ll. 51-53). At c. 5, ll. 62-64, Shackle et al. note "converter 12 (Fig. 1) and many other types of boost circuits may be used for unregulated boost 52." A boost circuit is

defined by Shackle et al. at c. 2, ll. 31-35, as a circuit that increases the DC voltage, e.g., from approximately 170 volts to 300 volts.

Further, it should be noted that converter 12 of Fig. 1 and circuit 60 of Fig. 6 are both boost converters and are functionally the same. At c. 4, ll. 54-55, Shackle et al. state that the converter 12 includes a boost circuit comprising the inductor 21, the transistor Q_1, and the diode 23. Referring to Fig. 6, note that the circuit 60 (i.e., the boost converter 60) also includes the inductor 21, the transistor Q_1, and the diode 23.

Moving on to the Examiner's rejection of claim 7 under 35 U.S.C. 102(b) as being anticipated by Shackle et al., Applicants note that the boost converter 60 is indeed a current drawing circuit. However, the boost converter 60 will draw current throughout the entire line cycle and not **only** near the zero-crossings. Accordingly, claim 7 has been amended to state "wherein said current drawing circuit draws current from said AC line only when the instantaneous voltage of said AC line nears zero to reduce the total harmonic distortion of the input current drawn by said ballast." It is submitted that this amendment distinguishes over "current drawing circuits" that draw current from the AC line at times other than when the AC line voltage "nears zero," such as the circuit 60 of Shackle et al.

Regarding the Examiner's rejection of claim 8 under 35 U.S.C. 102(b) as being anticipated by Shackle et al., it is submitted that the circuit 60 of Shackle et al. is a boost converter, not a cat-ear circuit. At p. 24, ll. 17-19, the present application states that a cat-ear supply "draws current from the rectifier 820 only at the 'tails' of the input line cycle, that is, the regions of the input line cycle adjacent to the line voltage zero crossings, as shown in Fig. 28." Shackle et al. simply do not disclose a cat-ear circuit. Accordingly, Claims 7 and 8 should be allowable in view of the amendment to claim 7, and the arguments presented above.

Turning to the Examiner's rejection of claims 18-22 under 35 U.S.C. 102(b) as being anticipated by Shackle et al., it is submitted that the circuit 60 of Shackle et al. is a boost converter, not a valley-fill circuit, using the same reasoning made with respect to claim 8 above. One skilled in the art will definitely recognize that the circuit 60 of Fig. 6 is not a valley-fill circuit. Noting p. 3, ll. 24-27 of the present application, a valley-fill circuit includes an energy storage element for "filling the valleys between successive rectified voltage peaks". This is not the operation of the boost converter 60, which increases the DC voltage (c. 2, ll. 31-35 of Shackle

et al.). Also, note that the valley-fill circuit of an embodiment of the present invention includes a buck converter that prevents the bus capacitor from charging to more than the peak of the rectified line voltage (see p. 11, ll. 17-22 of the present application).

Further, the circuit 60 of Shackle et al. does not charge an energy storage device through an electronic switch. Contrary to the Examiner's statement, the circuit 60 of Shackle et al. does not charge the "capacitor next to the rectifier 17" since this capacitor is on the line side of circuit 60. To the extent that the capacitor of Shackle et al. may be charged "through" anything, it will be charged through the rectifier 17.

Claims 19-22 depend from claim 18 and are patentable for the same reasons as stated above.

Moving on to the Examiner's rejection of claims 7 and 8 under 35 U.S.C. 102(e) as being anticipated by Quazi et al., Applicants note that the current drawing circuit (C1, D1, D2) of Quazi et al. does not draw current from the AC line **only** near zero. Further, it is submitted that the Examiner has referred to a current drawing circuit (60) in the rejection of claim 7. However, there is no element 60 in Quazi et al.

In regards to the Examiner's rejection of claim 8 as being anticipated by Quazi et al., it is submitted that the capacitor C1 is not a cat ear circuit. In fact, the capacitor C1 will **not** draw current when the AC line is near zero. The capacitor C1 will charge near the peak of the AC line and then discharge to (i.e., supply current to) the rest of the ballast near the zero-crossings of the AC line voltage.

Regarding the Examiner's rejection of claims 10 and 12 under 35 U.S.C. 102(b) as being anticipated by Jones, Applicants note that the Examiner refers to an element F2. However, there is no such element F2 in Jones. It is assumed that the Examiner is referring to the fuse F1 of Jones.

First, the capacitor C7, the inductor L2, and the fuse F1 do not form a valley-fill circuit. These components are on the AC-side of the rectifier, whereas a valley-fill circuit would be coupled to the output of the rectifier to fill in the valleys between the peaks of the rectified voltage. Second, the capacitor C7 is in fact a filter capacitor (see c. 2, ll. 56-57 of Jones) and charges and discharges directly from the AC line, not through the inductor L1 and the fuse F1. Third, the fuse F1 is a protective fuse (see c. 2, l. 61 of Jones), not an electronic switching device.

The circuit of Jones does include a valley-fill circuit, comprising the capacitors C3 and C4, and the diodes D5, D6, D9, and D10. However, the valley-fill circuit of Jones does not include an electronic switch for charging energy storage device through an impedance. The inductor L2 is not part of the valley-fill circuit of Jones since the inductor L2 is on the AC-side of the rectifier, and hence, cannot be part of the valley-fill circuit. Additionally, the valley-fill circuit does not charge the capacitors C3, C4 through an electronic switching device. Neither the protective fuse F1 nor the rectifier is an electronic switching device. In any event, neither the fuse F1 nor the rectifier is in the valley-fill circuit, as noted above.

Regarding the Examiner's rejection of claim 12, the inductor L2 is not in the valley-fill circuit.

Claims 10 and 12 should thus be allowable.

In the **Allowable Subject Matter** section of the office action a typographical error is present that Applicants would like to bring to the attention of the Examiner. On page 6 of the Office Action, in the second paragraph, the Examiner has stated "a predetermined portion of each half cycle which is greater than 900 of each half cycle". This should read "90°", i.e., 90 degrees.

In view of the above, it is submitted that all claims are now in condition for allowance, prompt notification of which is requested.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on June 22, 2005.

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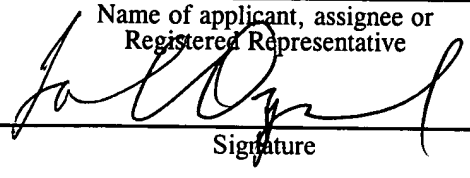

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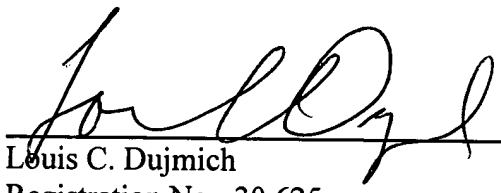
Respectfully submitted,



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